TENDINOPATHY CLINICAL PRACTICE GUIDELINE

Disclaimer

Progression depends on factors such as soft tissue healing, patient demographics, and clinical evaluation.

For questions, contact Dr. Sujan Gogu's clinic.

Background

1. **Condition**: Tendinopathy is a prevalent condition marked by pain due to mechanical loading of a tendon, resulting in significant limitations in daily and sport activities.

2. **Etiology**: It involves both external and internal factors and is seen as a continuum of tissue pathology, including reactive or reactive-on-degenerative phases.

3. **Rehabilitation**: A critical factor in rehabilitation is whether the tendon reacts with increased pain that does not return to baseline levels within 24 hours.

4. **Management**: Progressive mechanical loading is an effective approach. Various strength training methods, including isometric, isotonic, isolated eccentric, and isokinetic exercises, can help manage pain, improve motor control, and enhance function.

5. **Recent Findings**: Isolated eccentric exercise is not necessarily superior to other types of loading, such as heavy-slow resistance (HSR) loading (up to 6RM). HSR loading targets both concentric and eccentric strength deficits and promotes better collagen turnover.

6 **Importance of Load Selection**: Choosing the right type and timing of load is crucial for restoring function. For instance, isometrics can alleviate pain and reduce muscle cortical inhibition.

7 **Functional Impact**: Tendinopathy can severely impact an individual's ability to perform and return to previous activity levels. Emerging research suggests central pain processing changes, such as central sensitization, may be present, indicating a possible benefit from cognitive-behavioral therapy and graded exposure.

7 **Clinical Management**: Effective management includes pain management, education, progressive mechanical loading, addressing kinetic chain deficits, and a gradual return to activity. Additional treatments like joint mobilizations and friction massage may be used if joint or muscle dysfunction affects movement patterns and tendon loading.

Definitions

Strong Level Evidence: Supported by systematic reviews, meta-analyses, or more than 5 RCTs.

- **Moderate Level Evidence**: Supported by 3-4 RCTs.
- **Low Level Evidence**: Supported by 1-2 RCTs or clinical case series.
- **Expert Opinion**: Based on case studies, expert opinions, or the authors' opinions

Category	Recommendations
Risk Factors	• General overuse • Repetitive tensile loading

Category	Recommendations
	• Combination of tensile, shear, and compressive forces
Differential Diagnosis	• Partial or complete tendon ruptures • Muscle strain • Stress reactions or fractures • Nerve entrapment
Examination	• **Use Outcome Measure:** VISA *(Victorian Institute of Sport Assessment)* for body-part specific evaluation • Assess impairments and functional limitations • Identify isolated muscle or kinetic chain deficits
Classification	• Reactive • Reactive-on-degenerative
Phases of Progression	• **Pain Reduction and Load Management**: • Employ isometric loading and avoid compressive positions (refer to appendix) • **Isotonic Loading**: • Implement heavy-slow resistance exercises focusing on concentric and eccentric phases • **Energy-Storage Loading**: • Incorporate plyometric exercises • **Return to Activity/Sport**: • Gradual reintegration into activities
Interventions	• Educate patients • Perform prolonged isometric contractions at moderate intensity (40-70%) with the tendon in a shortened range throughout rehab • Implement a progressive muscle-tendon loading program • Address kinetic chain deficits • Apply joint and soft tissue mobilizations to surrounding areas • Plan a structured return to activity/sport
Criteria for	• Achieve full and symmetrical range of motion (ROM) and

Category	Recommendations
Discharge	strength/power • Pass pain-free high load resistance tests for the muscle-tendon unit • Return to sport or activity without reactive pain • Implement a sustainable long-term maintenance program for symptom management

Phases and Description	
Phase	**Description**
Phase I: Pain Reduction and Load Management	**Indications**: • Reactive pain >3/10 during or post-activity lasting over 24 hours • Inability to maintain activity due to pain • Localized tenderness at tendon **Activity Modifications**: • Reduce loading and modify activity volume • Avoid compressive positions and end-range stretching • Educate patient on recovery, provide cognitive behavioral therapy if needed **Prolonged Isometric Contractions**: • Perform in a non-compressed position • 5 reps of 45-60 seconds, 2-3 times/day, 40%-70% maximal voluntary contraction, with 1-2 min rest **Treatment of Kinetic Chain Impairments**: • Assess and address local and regional movement issues **Criteria to Progress**: • Complete isotonic loading with <3/10 pain or no increase in baseline pain for over 24 hours • Reduced pain in daily activities
Phase II:	**Indications**:

Phase	Description
Isotonic Loading Progression	• Strength deficits in the muscle-tendon unit • History of painful loading **Heavy, Slow Resistance Exercise (HSR)**: • 3-4 sets of concentric-eccentric exercise, starting at 15 reps and reducing to 6 reps, every other day • Begin with modified ROM to avoid tendon compression, progress to full ROM as strength and pain allow **Stretching Exercises**: • Address ROM deficits without inducing reactive pain >24 hours **Prolonged Isometric Contractions**: • Same as Phase I for pain management **Cognitive Behavioral Therapy/Graded Exposure**: • For chronic pain or central sensitization cases **Criteria to Progress**: • Complete 3-4 sets of 6 reps throughout full ROM with minimal pain and no pain increase >24 hours • No pain in daily activities
Phase III: Energy Storage Loading Progression (Plyometrics)	**Indications**: • Symmetrical bilateral strength • Tolerance of energy storage exercises with minimal pain **Sport or Activity-Specific Movements:** • Increase volume and intensity as per sport/activity requirements **Heavy, Slow Resistance Exercise (HSR)**: • 3-4 sets of concentric-eccentric exercise, starting at 15 reps and reducing to 6 reps, every other day • Begin with modified ROM, progress to full ROM as allowed **Prolonged Isometric Contractions**: • Used as needed for pain management • Same as previous phases **Criteria to Progress**:

Phase	Description
	• Complete energy storage exercises with minimal pain and volume matching sport/activity demands
Phase IV: Return to Sport/Activity	**Indications**: • Ability to perform sport/activity-specific exercises with minimal pain **Proper Warm-up Routine**: • Gentle, dynamic movements relevant to the sport or activity **Sport or Activity-Specific Drills**: • Reintegration into competition, initially no more than every three days **Heavy, Slow Resistance Exercise (HSR)**: • 3-4 sets of concentric-eccentric exercise, starting at 15 reps and reducing to 6 reps, at least twice a week • Begin with modified ROM, progress to full ROM as strength and pain permit **Prolonged Isometric Contractions**: • Used as needed for pain management • Same as previous phases **Criteria for Discharge**: • Full ROM and strength/power • Pain-free high load resistance test, with no pain in compressive positions • Full training with minimal pain

Appendix 1: Example Weekly Structure for Phases 3 and 4

Day	Activity
Day 1	Plyometrics/Return to Play, Isometrics (if needed)
Day 2	Strength Training, Isometrics (if needed)
Day 3	Isometrics
Day 4	Rest

Day	Activity
Day 5	Plyometrics/Return to Play, Isometrics (if needed)
Day 6	Strength Training, Isometrics (if needed)
Day 7	Isometrics

Appendix 2: Common Sites of Tendon Compression

Tendon	Compression Site	Position of Compression	Recommended Modification
Achilles	Superior calcaneus	Ankle dorsiflexion	Perform heel raises
Tibialis Posterior	Medial malleolus	Anatomical pivot point	Use orthotics and heel raises
Long Head of Biceps	Bicipital groove	Shoulder extension	Adjust resting shoulder positions
Supraspinatus	Greater tuberosity	Shoulder adduction	Modify resting shoulder positions
Pectoralis	Humeral tuberosity	External rotation	Adjust upper extremity activities
Proximal Hamstrings	Ischial tuberosity	Hip flexion	Limit sitting and lunging
Gluteus Medius/Minimus	Greater trochanter	Hip adduction	Improve lumbopelvic control, sleep supine
Adductor Longus/Rectus Abdominus	Pubic ramus	Hip abduction/extension	Reduce loads in abduction/extension
Peroneal Tendons	Lateral malleolus	Anatomical pivot point	Perform heel raises
Quadriceps	Femoral	Deep knee flexion	Limit loads during deep

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	condyle		knee flexion